

## CLAIMS

1. A method for differentiating osteoclast precursor cells into  
5 osteoclasts, which comprises culturing the osteoclast precursor cells in the  
absence of accessory cells.

2. The method as claimed in claim 1, which uses a culture medium  
containing IL-3, IL-7, GM-CSF, eotaxin, eotaxin-2, eotaxin-3 or a mixture of  
two or more of them.

10 3. The method as claimed in claim 1 or 2, which uses a culture medium  
containing a culture supernatant of mitogen-stimulated peripheral blood  
mononuclear cells.

4. The method as claimed in claim 3, wherein the culture supernatant of  
mitogen-stimulated peripheral blood mononuclear cells is a culture  
15 supernatant of phytohemagglutinin-stimulated human peripheral blood  
mononuclear cells.

5. A method for isolating osteoclast precursor cells, which comprises  
culturing peripheral blood or joint fluid in the absence of cytokine for 1 to 3  
weeks.

20 6. The method as claimed in claim 5, in which the osteoclast precursor  
cells are isolated by adding peripheral blood or joint fluid to essential medium  
for mammalian cells in the absence of cytokine and culturing them at 35 -  
37 °C in 5 - 7 % CO<sub>2</sub>-containing air for 1 - 3 weeks to perish cells except  
osteoclast precursor cells.

25 7. An osteoclast precursor cell, which is obtainable by the method as  
claimed in claim 5 or 6.

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8. A method for differentiating osteoclast precursor cells obtained by the method claimed in claim 5 or 6 into osteoclasts, which comprises culturing the osteoclast precursor cells in the absence of accessory cells.

9. The method as claimed in claim 8, which uses a culture medium  
5 containing IL-3, IL-7, GM-CSF, eotaxin, eotaxin-2, eotaxin-3 or a mixture of two or more of them.

10. The method as claimed in claim 8 or 9, which uses a culture medium containing a culture supernatant of mitogen-stimulated peripheral blood mononuclear cells.

10 11. The method as claimed in claim 10, wherein the culture supernatant of mitogen-stimulated peripheral blood mononuclear cells is a culture supernatant of phytohemagglutinin-stimulated human peripheral blood mononuclear cells.

12. An osteoclast, which is obtainable by the method as claimed in any  
15 one of claims 1 to 4 and 8 to 11.

13. A method for screening agents for metabolic bone diseases, which comprises using the osteoclast precursor cells isolated by the method as claimed in claim 5 or 6.

14. A method for screening agents for metabolic bone diseases, which  
20 comprises using the osteoclast precursor cells as claimed in claim 7.

15. A method for screening agents for metabolic bone diseases, which comprises using the osteoclasts obtained by the method as claimed in any one of claims 1 to 4 and 8 to 11.

16. A method for screening agents for metabolic bone diseases, which  
25 comprises using the osteoclasts as claimed in claim 12.

17. An agent for metabolic bone diseases, which is obtainable by the

method as claimed in any one of claims 13 to 16.